



## **Framework for reports on urban energy planning in 6 case cities**

### **PLEEC Report D4.1**

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*Publication date:*  
2014

*Document version*  
Publisher's PDF, also known as Version of record

*Citation for published version (APA):*  
Fertner, C., Groth, N. B., Große, J., Read, S., Rocco, R., Meijers, E., Fernandez Maldonado, A. M., & Mashayekhi, A. (2014). *Framework for reports on urban energy planning in 6 case cities: PLEEC Report D4.1*. EU-FP7 project PLEEC. <http://www.pleecproject.eu>



Deliverable 4.1

# Framework for reports on urban energy planning in 6 case cities

**FINAL VERSION**

30 April 2014

Authors

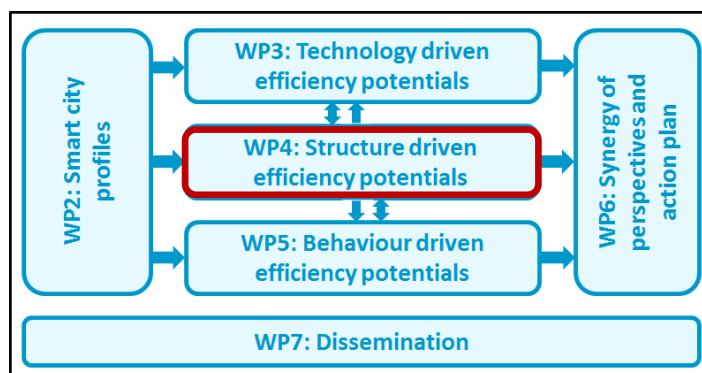
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## Abstract

### Main aim of report

The purpose of this report (Deliverable 4.1) is to provide guidance for the work on Deliverable 4.2 (D4.2). D4.2 will consist of six separate *case study reports* (or '*city reports*', one for each of the 6 PLEEC cities) which will be conducted by different persons of the Work package 4 (WP4)-team. Therefore it is important to have a joint framework, defining the relevant questions and issues which should be worked on. However, as the six cities are very different, the framework stays at a general level to allow different foci in each of the reports.



WP4 location in PLEEC project

### Target group

The main addressee is the WP4-team who will work on the case study reports (D4.2). The wider target group are other PLEEC partners who are interested in WP4's work as well as other professionals who would like to get inspiration how to conduct an analysis of energy issues in relation to spatial planning and urban form in medium-sized cities.

### Main findings/conclusions

Five main chapters are suggested to follow in all case study reports:

- Overview of city (geography, socio-economic, history, ...)
- Historical urban development and spatial planning development
- Evolution of national and local energy planning
- Management of urban planning and energy today
- Pilot projects / good examples of sustainable development which evolved out of the planning system

### Activities carried out including methodology used

This document is based on a continuous discussion between UCPH and TUD since July 2013, review of literature, the WP4 workshop in Stoke-on-Trent in November 2013, discussions undertaken around the virtual WP4 kick-off meeting in February 2014 with city partners and the WP4 workshop in Turku in March 2014. Some background material can be found in the Annex. Notes from the meetings are available on the internal PLEEC homepage.

### The PLEEC project

Energy efficiency is high on the European agenda. One of the goals of the European Union's 20-20-20 plan is to improve energy efficiency by 20% in 2020. However, holistic knowledge about energy efficiency potentials in cities is far from complete. Currently, a variety of individual strategies and approaches by different stakeholders tackling separate key aspects hinders strategic energy efficiency planning.

For this reason, the PLEEC project – "Planning for Energy Efficient Cities" – funded by the EU Seventh Framework Programme uses an integrative approach to achieve the sustainable, energy-efficient, smart city. By coordinating strategies and combining best practices, PLEEC will develop a general model for energy efficiency and sustainable city planning.

By connecting scientific excellence and innovative enterprises in the energy sector with ambitious and well-organized cities, the project aims to reduce energy use in Europe in the near future and will therefore be an important tool contributing to the EU's 20-20-20 targets.

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# 1 Introduction to WP4 – structure driven energy potentials

## 1.1 WP4 approach

WP4 focuses on **structure-driven energy efficiency potentials within urban planning**. We thereby understand ‘structure’ in WP4 as twofold: **(1) The institutional and planning dimension**. The urban governance structure, the structure of actors and instruments of urban planning at the municipal level, **(2) The spatial dimension**, including the physical structure of the city, its morphology, the urban form, the characteristics of the built environment. For both aspects, specific geographical/ natural, political, cultural and historical context should be emphasised

WP4 applies a **two-step approach**:

1. The first step is ‘**case-driven**’: We **collect knowledge** from the six cities and general academic literature on urban parameters (urban form, land use, transport, infrastructure, ...) and energy use. This results in:
  - a guidance document summarising important questions, methods and background material (D4.1) as input for
  - six case reports (D4.2), one for each city
2. The second step is ‘**model-driven**’: We will work on **synthesizing** the material, elaborating general descriptions of the relationship of urban structures and energy and how urban planning engages in that. This will result in
  - a report structuring knowledge by themes (e.g. housing, transport, land use) (D4.3), and
  - a short summary report (D4.4), preparing WP4 results to be transferred to WP6

The main engagement of the case cities regards collaboration in the first step by providing knowledge and data (e.g. through interviews and access to key documents) for the case study reports and also to draft sections of the case reports.

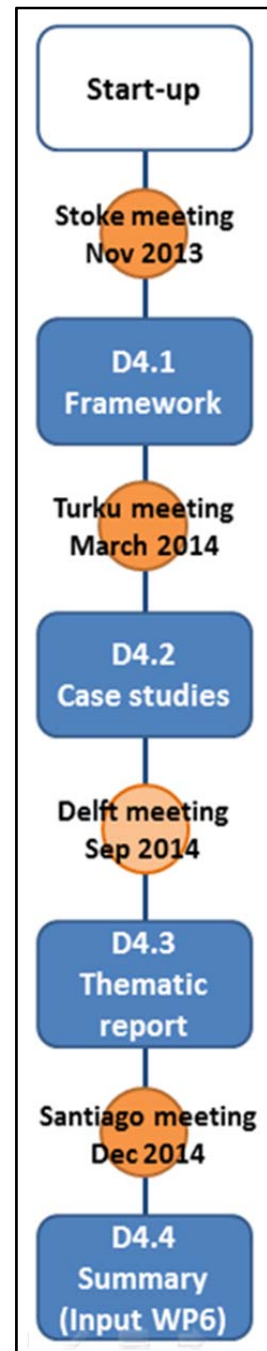


Figure 1: Major milestones in WP4, see also section 2

## 1.2 Structural aspects of energy efficiency

It is no secret that European cities have increased their energy footprints in the last century (Droege 2011;EEA 2006). This is in spite of the fact that heavy industry has been a decreasing proportion of the total economy for some decades now. Most visible is the enormous physical expansion of our cities in the last century and its implied problems especially regarding transport infrastructure and land consumption.

We can see these changes from a *use* and from a *generation* perspective. On the use (consumption) side, as the proportion of energy consumption in industry has declined, the increase has been predominantly due on the one hand to the consumption of energy in buildings for heating and cooling, and on the other to changes in modes of transport (the motorcar) and increases in travel distances due to suburbanisation. These changes are related to changes in urban form. Starting with the simple changes, there is an obvious structural effect on energy consumption due to urban size and population increase. Further structural changes occur as cities become less dense. On the one hand we see a rise in the net and proportional building heating load and heat loss. In cities that have undergone suburbanisation this will be linked to increases in house sizes, in stand-alone houses (higher surface area to volume ratios), and falls in the sizes of households. These changes will be helped along by changes in heating standards but will be offset by better standards of energy delivery, insulation and heat retention.

On the other hand we see large increases in daily travel distances and in the use of the motorcar. This is linked to increased separation of living and work places and a cultural and lifestyle preference for living in suburban settings. It is also linked to increases in the spatial (regional) extent of land (for housing, commercial and industrial use) and labour markets. These markets may also tend to discount the costs of travel within the region. We have to therefore understand today's increased energy use as structurally linked not only to the lifestyle preferences for motorcar use and suburban living but also to factors of the regional economy.

Between 1990 and 2006 Europe's population grew by 7 %, while the urban area in the same time grew by 37 % (Fertner 2012). On the other hand, compact and dense urban development is supposed to directly translating into lower energy use and carbon emissions per capita, less air and water pollution, and generally lower resource demands compared with less dense, less compact cities (Beatley 2003, 250). But we can see that the transition from a dispersed to a compact city is a complex process with factors and demands that conflict with aims of energy efficiency.

On the generation (production) side, relatively cheap and abundant energy has historically been associated with the exploitation of fossil fuel (coal and oil) sources. Energy efficiency can be understood in two rather different ways, firstly in terms of a net reduction of energy consumption, but also in terms of the replacement of non-renewable sources of energy with renewable or climate and environment impact-free sources of energy. In fact, energy demand is still rising and with declining coal and oil supplies, the gap between what these sources can deliver and demand will grow. This gap may be filled with a number of alternative sources and clearly there are alternatives which are more environmentally friendly. Energy consumption may also be replaced with local *production* of energy – as when building heating is provided by solar panels or heat-pumps for example, or cars are replaced by bicycles. Also a proliferation of greener

energy sources may offer more flexibility of supply and smart-gridding and novel storage means may offer efficiencies though clearly there are problems that will need to be solved regarding the technologies and economies of generation and supply, especially in daily and yearly peak periods.

Our concern here is with tendencies of more recent energy consumption and generation, related to structural changes in populations, urban regions, housing, transportation and cultural and economic ways of life:

- urban size and population increases alongside increasing housing demands (more),
- de-densification of building volumes with suburban dispersal, the growth of single-family suburban housing, and other factors, leading to higher heating costs and energy losses (offset by better heating efficiency techniques and practices),
- changes in demands for residential and other space heating and cooling, alongside district heating and other technical and organisational advances, and
- changes in daily commuting patterns and increases in daily travel distances, along with changes in residential patterns at the regional scale and the rise of the motorcar as favoured transportation mode.
- increase of economic wealth and rise of the middle class made energy more affordable (more)
- Demographic change, e.g. more single households (more)

Understood in an historical perspective we can see changes in regional structure as being a significant cause of increases in energy consumption. It thus goes without question that urban development has been a driver for enhanced energy consumption. Due to the irreversibility of urban development ('lock-in'), a crucial question is whether in the future urban development can be turned into a driver of energy savings? Rather likely it is that large scale national energy policy is the key instrument and that the key issue of urban development is about facilitation of national policies and introduction of energy-sound urban development schemes.



## 2 Organisation of case study work

This report (Deliverable 4.1) is a framework for how to structure the case study reports and which questions and themes should be dealt with. The framework was elaborated in collaboration between WP4 partners. Building on the joint framework, the work on the case study reports (Deliverable 4.2) will be split between partners as shown in Table 1.

**Table 1: Responsible partners for case study reports (Deliverables 4.2)**

Case	University partner	Local partner
Eskilstuna	UCPH	Eskilstuna City
Tartu	UCPH	Tartu City
Turku	UCPH with TUAS	Turku City / Valonia
Jyväskylä	TUD with TUAS	Jyväskylä City
Santiago de Compostela	TUD	Santiago de Compostela City
Stoke-on-Trent	TUD	Stoke-on-Trent City

The case study work has started informally already with the first WP4 workshop in Stoke-on-Trent in November 2013. At the meeting in Turku in March 2014 we concretised the themes for the reports and discussed first findings.

In terms of work load it is expected that the main share of WP4 goes to the elaboration of the case city reports (D4.2). The distributed person months per partner in WP4 can be seen in the PLEEC Description of Work (Workplan table 6, page 30). However, each partner is self-responsible to dedicate person months in an appropriate manner.

UCPH or TUD will be coordinator and main contributor in D4.2. The city partners will be involved in supporting the material collection, providing input for particular sections (e.g. description of key projects) and in discussing and reviewing the report. The concrete organisation of the work has to be done within each case separately.

**The core work on the case study reports takes place from March to August 2014.** The work will be facilitated by regular Skype meetings between the university partners. An exchange between the city partners is also desirable, workshop-style discussions are though unfeasible over Skype and the next official meeting with all participants is first planned for December (Santiago). Still, any other opportunity to exchange (e.g. during a potential EEF meeting or BAP-event in Copenhagen in October) will be considered.

**End of August 2014 draft reports** for each case should be ready, so we can start the discussion on cross-cutting issues (Deliverable 4.3). The discussion will be facilitated by a 1-2 day seminar at TU Delft in September 2014 (date to be decided). Although all WP4 partners are welcome to join for that meeting, it is only realistic for UCPH to visit TU Delft, as there is no specific budget allocated for such a meeting in the project. However, 1-2 weeks prior to the meeting all reports will be sent out as draft to the city partners to allow for commenting before the meeting.

The **final case reports** should be ready for the meeting in Santiago de Compostela in **beginning of December 2014**. At that meeting also a draft for Deliverable 4.3 will be ready.

### 3 Disposition for the case study reports

**Table 2: Proposed table of content of the six case study reports**

Chapter	Title	Approx. pages *
0	Abstract (following the general PLEEC-report template)	1
1	Generic WP4 and D4.2 introduction	1
2	Methods/data <i>(short presentation of used methods, e.g. interviews, data etc.)</i>	2
3	Overview of city <i>(geography, socio-economic...) incl. WP2 smart city profile results</i>	5
4	Historical urban development and spatial planning development <i>(to understand the current urban structure)</i>	10
5	Evolution of national and local energy planning <i>Energy situation in country, (historical) drivers, key legislation, impacts on city &amp; implementation in city</i>	10
6	Management of urban planning and energy today <i>Main actors, roles and distribution of competencies; Main policy documents and planning tools</i>	10
7	Pilot projects / good examples of sustainable development which evolved out of the planning system	10
8	Summary of urban energy planning in the city	2
9	Perspectives for thematic report (D4.3)	2
10	Lessons and links to other PLEEC work packages	2
11	References	
	<b>Total</b>	<b>50</b>

*\* This is only for rough orientation and should be held flexible to adjust to the case study.*

When we have agreed on the table of content, a **template file (.docx) for the reports** will be sent out by UCPH so we can ensure a common formatting style and structure in all 6 reports.

In the following section background information for each chapter can be found.

## 4 Main questions for each chapter

### Chapter 3: Overview of the city

#### Question: What kind of city is this?

This section introduces the city's general characteristics help to set the city in a context. Main material can be basic information from the city (from websites etc.), general literature and also the material produced in WP2, especially D2.1 (European Smart City profile) and D2.3 (Energy Smart City profiles). The following subsections could be used:

- General introduction (location, city image/role)
- Short overview from WP2 city profiles (D2.1 and D2.3)
- History (Industrialisation/ industrial change/ population growth/ housing/ phases of development/ regional development)
- Local assets (Economy/industry, education, culture and tourism), including basic statistics on socio-economics and demographics
- Ambitions (from the city administration, in general and in regards to urban development and energy efficiency)
  - Also: How are the 20-20-20 goals translated to the city context?

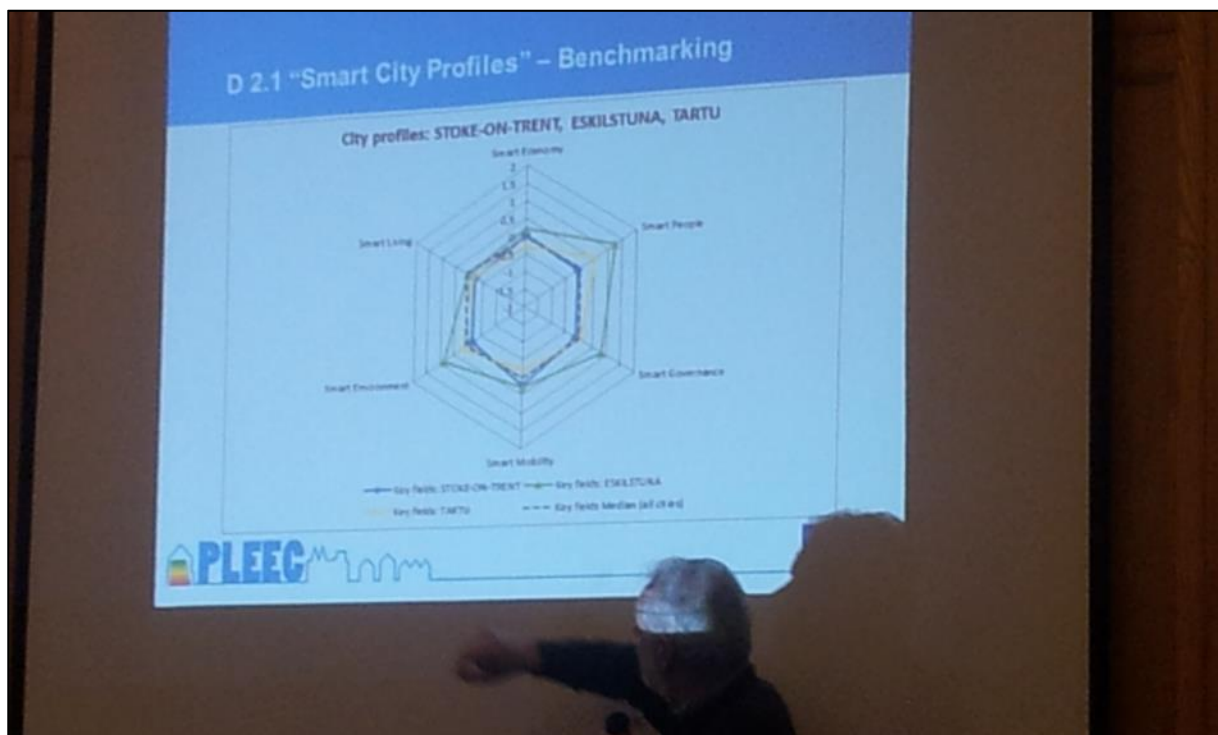


Figure 1: Presentation of WP2's Smart City profiles (D2.1) in Stoke-on-Trent

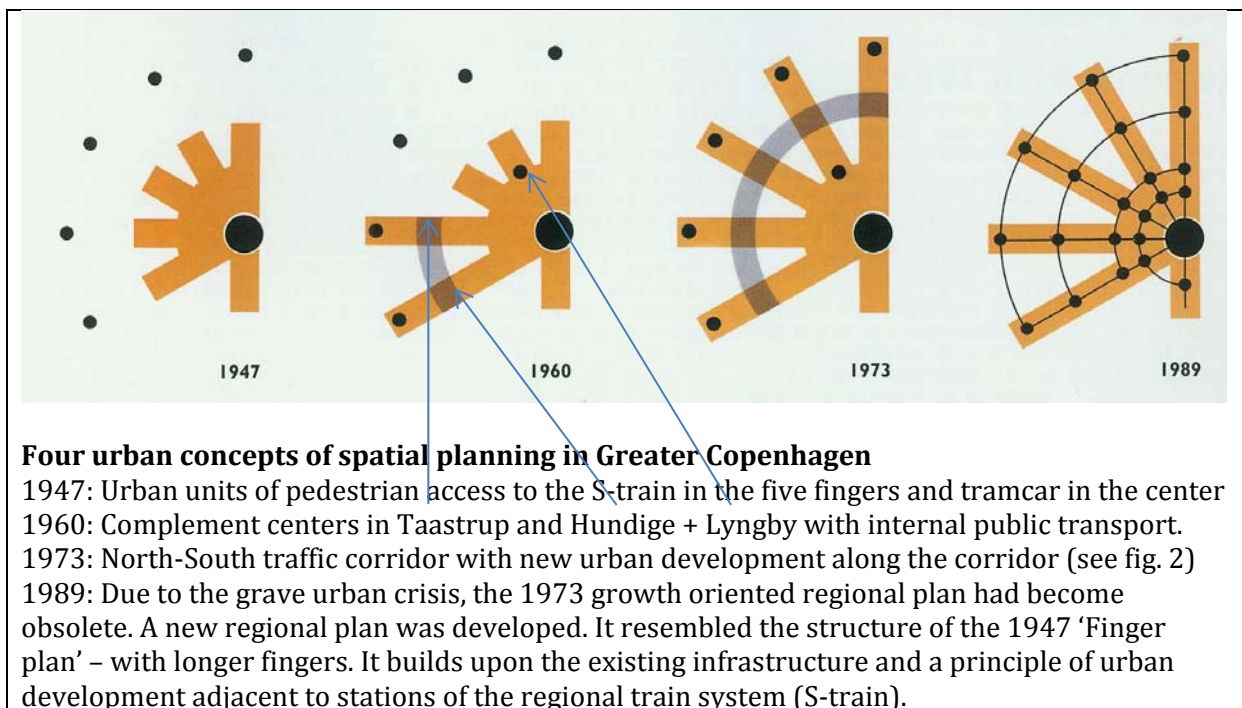
## Chapter 4: Historical urban development and spatial planning development

**Question: How did the city develop in recent decades, what planning ideas were introduced for the general urban development and how did this shape the cities current structure?**

This section shall give an overview over the urban development in recent decades, e.g. since 1940s or at least since 1970s (oil crisis). Important structural plans should be used to illustrate the main trends of urban development as well the influence of shifting (planning) paradigms (growth, restructuring, decline, compact etc.). Two main elements should be focused on:

1. Patterns of zoning for living, industry, commercial centres and large institutions
2. Transport infrastructure

Only a few plans are needed. If major changes in urban planning took place, they should be included (e.g. changes due to growth, population or industrial decline or new ideas about the structure of urban development)



**Figure 2: Example from the Copenhagen region on shifting planning paradigms**

**Sub-question 1: Did any principles of energy saving influence the structure plans?**

This could be:

1. Increasing the density of new housing / promotion of infill housing in existing areas?
2. Introducing public transport-lead urban development schemes (e.g. urban development adjacent to public transport hubs)
3. Introducing bicycling lanes

**Sub-question 2: How is the city situated in the regional labour market?**

This could be illuminated with descriptions of eventually single large labour intensive workplaces + commuting patterns at three periods: 1970 – 1990 – 2010.

## Chapter 5: Evolution of national and local energy planning

### Question: How did national and local energy policy and awareness evolve and how did/does it frame urban energy planning?

It is supposed that national energy planning is about framing the conditions for operational local energy planning. Is that true? If not, are national agencies operating at the local level?

#### Sub-question 1: Are any national policies framing the kind of local energy supply e.g. natural gas? – water turbines? – bio-fuels?

How are ambitions with regard to energy efficiency formulated? How are policy priorities decided? Have national milestones been set – concerning:

- Reduction of overall energy consumption?
- Introducing renewables in energy production?

Does national energy policy include goals for changing the energy supply in urban settings – e.g.

- Increasing district heating in urban build up areas?
- Increasing heat-pumps in rural areas at individual or neighbourhood levels?
- Has urban sustainable planning and development been included in the national energy planning?

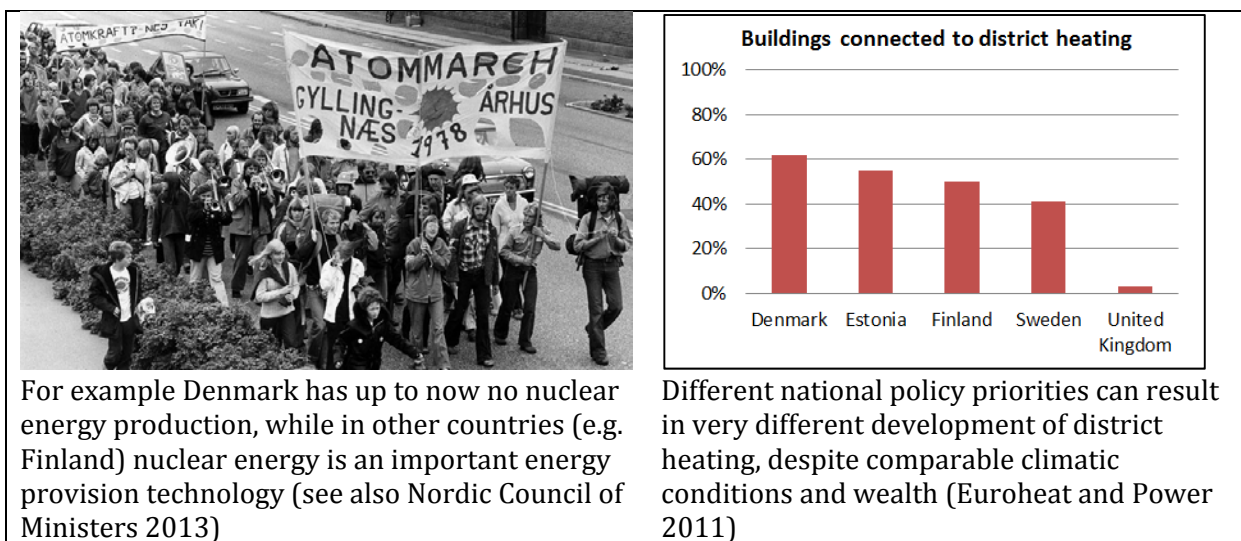


Figure 3: Example of different energy situations in some PLEEC countries

#### Sub-question 2: Effect on the operational local energy planning

Have any principles in spatial planning (see pervious section), technologies in heating, principles in transport – or pilot projects been introduced?

Does then city use energy districts for energy planning – i.e. zoning of areas in which some specific energy supply is compulsory (common energy supply rather than individual supply, supply from specific energy resources)? If so, the energy districts should be mapped.

Have any conflicts between local and national energy policies occurred?

## Chapter 6: Management of urban planning and energy today

### Question: What is energy planning in the city in question today?

- In response to what contemporary 'substantive' (industrial use, demographic, lifestyle, transport and commuting (walking, cycling, public transportation, motorcar), housing and district heating (urban and suburban), urban structure) conditions and priorities?
- In response to what contemporary planning and policy ambitions and directives?
- What is the role of planning today? (responsibility, communication, education, promotion and participation, implementation)
- How is energy provided and used at substantive levels (see point 1 above)?
- What policies, priorities, practices and regulations control or attempt to control that use? What incentives are in place for reduction of energy use?
- What are the national and local planning structures involved and how do these work in formulating and implementing policies, priorities, practices and regulations?
- How are particular projects for the promotion of energy efficiency initiated and implemented?

### Sub-question 1: Who initiates policy and how is this translated into practice?

- What are the relevant elements of European and national planning policy?
- Through what instruments are these connected to the city in question?
- Through what initiatives/ directives are they promoted and incorporated into local policy and practice?

### Sub-question 2: How is the local practice and regulation side structured and implemented?

- What are the key elements of local energy policy?
- What stakeholders are involved and what are their respective roles?
- What are the key instruments of promotion, education, regulation and implementation?
- What elements are missed/ not incorporated?

### Sub-question 3: What are the key documents?

These should be sorted and classified according to planning and governance 'levels'.



## Chapter 7: Pilot projects / good examples of sustainable development which evolved out of the planning system

**Question: What are the key projects through which 'structural' energy efficiency is promoted, developed and implemented in the city in question today?**

Here 2-3 projects within the city should be presented, illustrating some of the above mentioned in a concrete case. If we take 'structural' to point to things related to 'infrastructures' (supply, transportation, district or mass heating, urban structure, even the 'infrastructures' of energy planning, management and associations of stakeholders (non-regular 'assemblages' of forestry industry, local farmers and small industries, electricity supply companies, municipal waste collection and processing, and planning authority for example). Specify which of these for each project.

The description of each project should include:

- aims and ambitions
- planning aspects
- stakeholders and their effective participation and roles
- how the success of the project can be measured by its structural effect on energy consumption. For a more concrete evaluation, questions from the checklist mentioned in the Annex (section 6.3) could be applied.

Examples:

- a cluster of projects, one promoting bicycle use in the central urban area and building a dedicated bicycle path system separated from motor traffic, another encouraging businesses to relocate in old industrial sites on the edge of the central urban area, and another promoting 'loft-living' in abandoned industrial buildings and offices in the central urban area. These together can promote a culture-lifestyle of short-range commuting and regeneration of the 'compact' central urban area.
- a cooperation between the forestry industry, local farmers and small industries, electricity supply companies, municipal waste collection and processing, and the planning authority to make 50% of electricity distributed in the city from renewable resources by 2020.
- A densification strategy for the urban area and limitation of detached housing development within the city-region to reduce energy consumption for transport and heating, accompanied by the development of affordable or shared second homes in the hinterland with only limited infrastructure supply on a self-sufficient basis, but connected to flexible individual transport systems.

## **Chapter 8: Summary of urban energy planning in the city**

A short summary of the general development and the energy situation and planning in the city – based on the previous chapters, including lessons for good practice and potentials for improvement.

## **Chapter 9: Perspectives for the thematic report**

Perspectives for the thematic report (D4.3) should be given, e.g. particular themes which should be analysed in depth across cases and other literature.

## **Chapter 10: Lessons for and links to other PLEEC work packages**

WP4 runs parallel with WP3 and WP5. During the work it is important to coordinate and exchange with these two WPs as there are a lot of potential overlaps. E.g. the built environment and urban structure are closely related to which technologies (WP3) we apply, e.g. regarding district heating; also built environment and urban structure are closely related to human behaviour (WP5), e.g. transport choice.

Also, feedback to WP2, although finalized already, could be given, e.g. regarding the applicability of the identified key fields and domains to discuss energy and urban structure.

Finally, remarks should be given regarding how to bring these results further into WP6:

- what could be used for a future Action Plan of the city and
- what could be used for a more general model of an energy efficient city?



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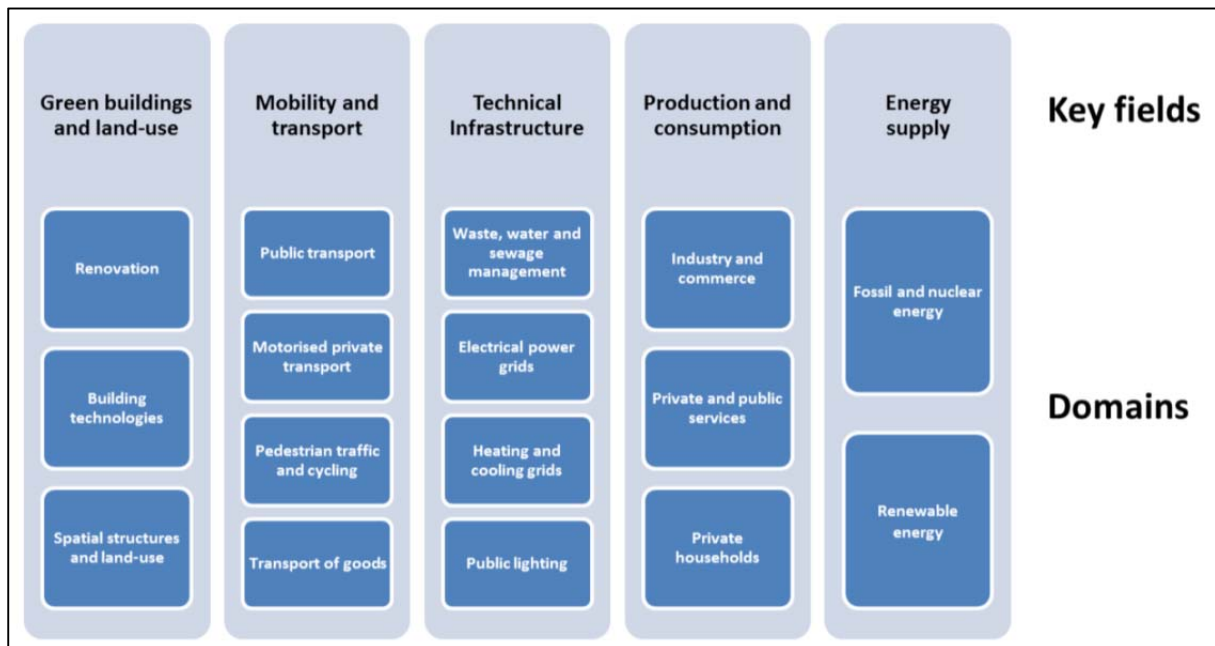
## 6 ANNEX

The Annex presents a summary of various previously elaborated material in WP4 or relevant to WP4 which can be useful for the further work.

## 6.1 Work to carry further from WP2

There are a number of outputs from WP2 which should be used and possibly developed further:

- Key fields and domains of energy efficiency – we should use similar terms if possible as developed in WP2 – see Figure below. This will also make our results easier to carry further in WP6.
- General info on city (D2.1 & D2.2) – for the introduction, to have a broad understanding of the general development as well as the perspectives of stakeholders on energy issues
- Energy situation in city (D2.3) – for the introduction, to have a broad understanding of different energy situations in the cities



**Figure 4: Key fields and domains of urban energy efficiency as indicated in WP2 in PLEEC (Giffinger et al. 2014)**

WP2 material is available on the internal PLEEC homepage in the WP2-folder.

## 6.2 Guide for interviews with stakeholders

The current plan for conducting interviews with stakeholders in the partner cities is as follows:

**Table 3: Plan for interviews**

Partner city	Interviewers	Date
Turku	Christian, Juliane (UCPH), Roberto (TUD), Jari (TUAS)	24/25 March 2014
Eskilstuna	Juliane, Niels (UCPH)	7/8 May 2014
Tartu	Juliane, Niels (UCPH)	5/6 June 2014
Santiago de Compostela	Ana Maria (TUD)	Spring-Summer 2014
Stoke-on-Trent	Roberto (TUD)	Spring-Summer 2014
Jyväskylä	Stephen (TUD), Jari (TUAS)	Spring-Summer 2014

In Turku interviews were already conducted end of March before the Turku meeting. The following people were interviewed in Turku:

- **Risto Veivo**, Development Manager, Climate, Environment Policy and Sustainable Development of City Group, Central Administration, City of Turku
- **Oscu Uurasmaa**, City Planning Architect, Skanssi Project, City Planning/ Environmental Section, City of Turku
- **Antto Kulla**, Development manager, Oy Turku Energia - Åbo Energi Ab + colleagues (one from electric grid, one from district heating)
- **Jaana Mäkinen**, Traffic & Transportation office, City of Turku + colleague
- **Aleksis Klap**, Natural resource planner, Regional Council of Southwest Finland

Persons in similar functions should be considered for interviews in the other cities. Also politicians or persons engaged in relevant NGOs could be considered to get different views on particular issues.

**The following questions (also related to the 4 main sections of the report) are suggested to guide the interviews:**

### 1. National energy regulations and frame conditions as seen from the municipality

- What kind of regulations for municipal energy supply/consumption has been issued by the national government since 1970?

### 2. Spatial planning evolution

- In order to fully understand the current planning schemes, we could like to provide an overview of the kind of problems and goals planning since the 1940s has dealt with (such as growth, restructuring, decline or special topics or policies, e.g. national housing programs, local industrial development, deindustrialization, ...).
- Did any change of overall planning concepts take place
- Please provide copies of representative structure plans (Land-use plans and/or conceptual plans)
- Was any energy perspective introduced in spatial planning? (e.g. compact urban development – urban development matching public transportation structure)

### **3. Transport planning**

- What are the main characteristics of the public transport system?
  - Organization
  - Main lines (Map)

### **4. Regional planning**

- Has any regional planning affected the municipal spatial planning?

### **5. Urban management and public supply**

- What kind of energy systems are developed in the city?
- Has the city been structured in energy districts for special energy supply? - if so:
  - Please provide maps with energy districts – using the current structure plan of the city
  - How is the distribution of district heating and individual heating? (in percentages and on maps)
- Please provide numbers and maps showing the distribution of public and private housing
- Has the municipality launched public campaigns, incitement systems or tariff-regulations for energy savings?

### **6. Good practice of sustainable development**

- Has the city been involved in good examples of sustainable urban or residential development schemes? – if so
  - Please provide information material

### **7. National/local energy policy**

- What is the main target of national and local energy policy
  - Energy efficiency (i.e. reducing energy consumption)
  - Climate efficiency (i.e. reduction of fossils in energy production)

### 6.3 Potential checklist for basic socio-spatial features of case cities

This checklist, developed by Evert Meijers and colleagues at TU Delft, is a gross list of potential data which could be collected to support the work on the different chapters of the case reports. This is for inspiration only and needs to be adapted to the specific case reports.

#### Transportation, mobility and energy use aspects

1. What is the modal split in your city/area?
2. What are alternatively fueled modes of transportation in your city? What is the percentage of these in relation to total?
3. What are actions taken by your city to increase alternative/soft ways of transportation? (biking schemes? Alternatively fueled public transport?)
4. Does your city have a bicycle mobility strategy connected to energy saving?
5. Are there TOD strategies in place? (e.g. densification around transport hubs)
6. Are there TOD schemes connected to energy saving strategies? Is mobility connected to energy saving measures in your city?
7. What is the % of in and out commuters? Impact on energy efficiency?
8. Which percentage of residents is able to reach work/amenities/services within reasonable time using public transport/walking/cycling?

#### Residential energy use aspects

1. What percentage of buildings are oriented to the south?
2. Are there zoning plans/regulations/strategies that take this fact into account, and try to stimulate orienting new buildings to the south?
3. Are there neighbourhoods connected to neighbourhood heating schemes?
4. Are there regulations/plans concerning connection to neighbourhood heating?
5. Maps of energy consumption (differences of energy consumption in different neighbourhoods?)
6. Maps of residential energy consumption in relation to age of buildings?
7. Specific building regulation in relation to energy efficiency? Since when? Impact perceived?
8. How much can your municipality enforce these measures/control adherence to regulations?

#### Industrial and commercial energy use

1. What is the industrial make-up/profile of your city?
2. What's the percentage of industrial output in the total GDP of your city?
3. What are schemes for energy saving in industrial activity in your city?
4. What's the percentage of commercial/services output in the total GDP of your city?
5. What are schemes for energy saving in commercial activity in your city?
6. Are there policies discouraging/encouraging certain types of economic activity relevant/connected to energy efficiency measures?

#### Generation and distribution of energy

1. What is the main source of energy in your city? What is the energy split?
2. Are there schemes to produce energy locally? Effective?
3. What are alternative sources of energy being pursued?

4. Are there policies concerning pricing that aim to reduce energy consumption enforced by the local government?

### **Present Urban Form**

1. Can you provide a map of different densities in your city?
2. Can you provide a map showing the age of buildings? (only relevant in connection to different building rules affecting energy efficiency in the different periods)
3. Map of industrial sites/commercial sites/ residential areas?
4. Which percentage of housing is detached/semi-detached/attached/terraced?

### **Territorial management strategies**

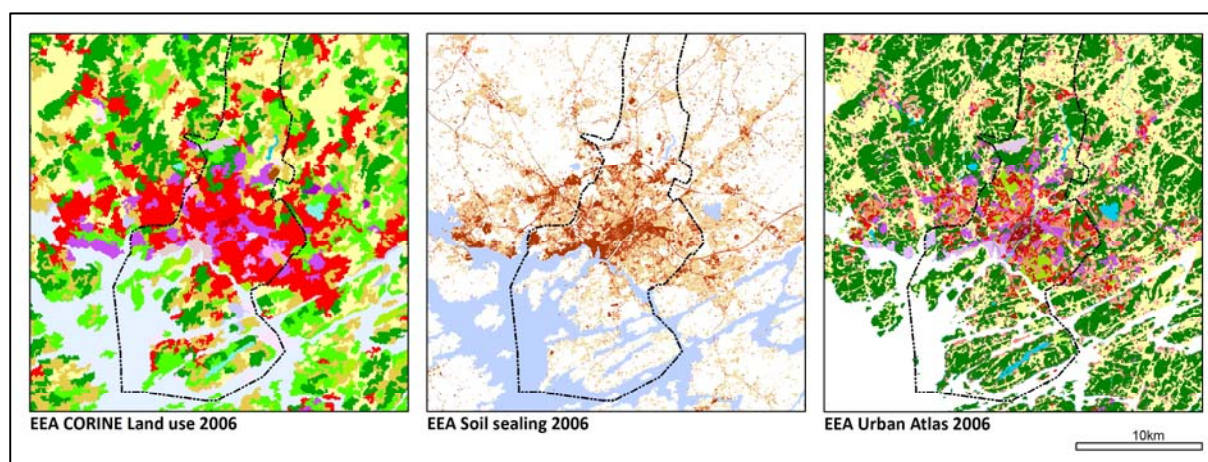
1. Is there a development/expansion strategy connected to energy saving?
2. Are there explicit directives concerning the form of new developments and energy efficiency? (orientation to south, direction of streets, green coverage, degree of soil permeability/reflective materials? Height of new buildings? Typologies (single houses/ apartment blocks) etc.

## 6.4 General data on land use and spatial development to supply locally available data

WP2 delivers a range of statistical data, which are however on the aggregated city level. For WP4 it will be necessary to have more detailed data as well. This can be obtained through the city partners or through general databases. Regarding land use there are a few sources on European level which might be relevant to use, also because of reasons of comparability. See also WP4 working paper 2 (Fertner and Rocco 2013) for more detail.

**Table 4: European data sources providing land use data for the 6 cities**

Data set	Time	Detail	Coverage
CORINE or UMZ (EEA)	1990, 2000, 2006	Min mapping unit 25 ha, min change 5 ha, vector/100x100m raster	All cities
Soil sealing (EEA)	2006	20x20 or 100x100m raster	All cities
Urban Atlas (EEA)	2006	Min mapping unit 0.25 or 1 ha, vector	excl. Eskilstuna and Jyväskylä



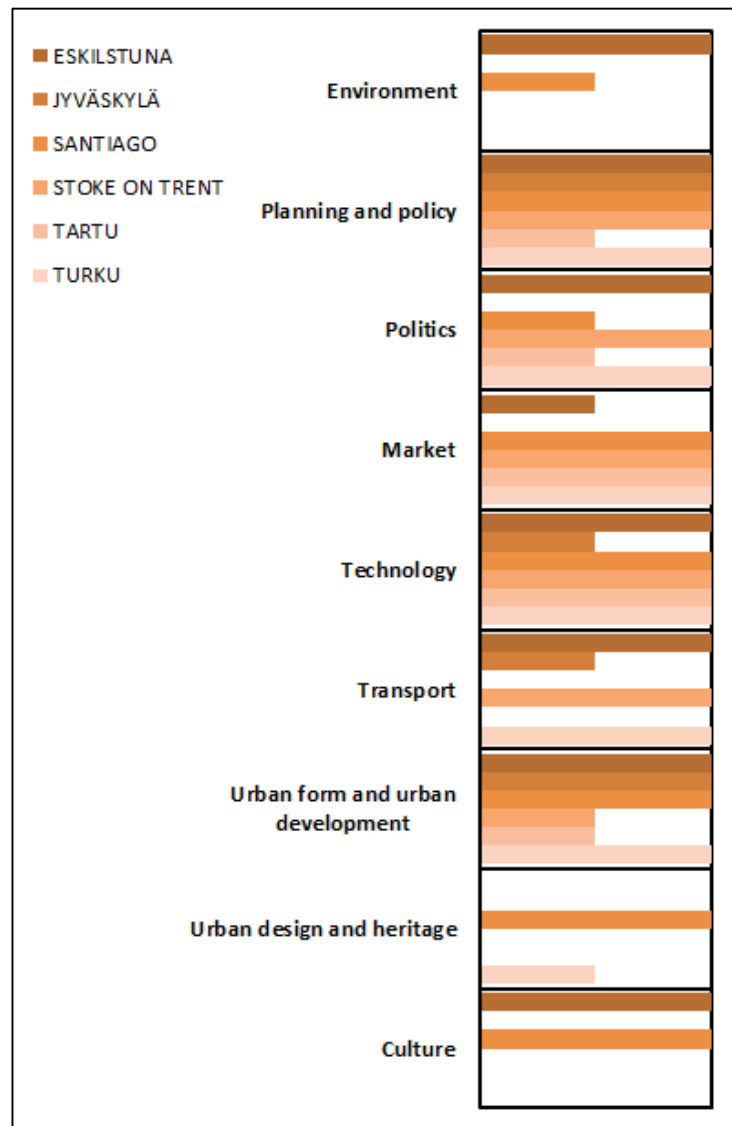
**Figure 5: Turku represented in three European land cover/use databases**



## 6.5 Workshop Stoke-on-Trent: First insights on spatial planning policies and energy efficiency in the case cities

At the project meeting in Stoke-on-Trent in November 2013 a small workshop was held where city representatives were asked to tell about policies which are put in place in the city to increase energy efficiency. The notes were afterwards structured by general themes. Some themes like spatial planning and policy, market incentives or the introduction of new technologies were strongly mentioned by all partners, while environmental issues, transport, urban design, heritage and culture were only mentioned by some (see Figure 6). Also other PLEEC partners participated in the workshop, however, here only comments from city partners are presented.

**Figure 6: Main themes in the discussion in Stoke-on-Trent**



**Table 5: Key words by case city representative mentioned in Stoke-workshop, structured by topics.**

	<b>ESKILS-TUNA</b>	<b>JYVÄSKYLÄ</b>	<b>SANTIAGO</b>	<b>STOKE ON TRENT</b>	<b>TARTU</b>	<b>TURKU</b>
Participants	4	1	2	2	1	3
<b>Environ-ment</b>	Biological Ecological aspects environmental communities food green city		preservation of common goods			
<b>Planning and policy</b>	building permits building rights Climate Plan land use plan local plans national directives plans scenario planning and modelling simulations steer development Zoning	not very effective for individual builders strict regulations in building practices Zoning	building permits LAND USE PLANS strict rules Urban General Organization Plan ZONING	Building regulations Development Plan LOCAL PLAN national central land use planning pro- sustainability tactics	land use plans	city planning not many regulations planning department project based Regional Structural Plan structural plan
<b>Politics</b>	officials advising politicians political will Politicians Voters advice		neighbouring municipalities	central government local government GREEN DEAL	national government	Mayor several municipalities
<b>Market</b>	incentives		construction companies increase costs	borrow money private companies electric bills	land owners privately owned	Siemens private sector expensive
<b>Technology</b>	district heating energy efficiency energy saving measures heat pumps heat pumps are simply not as energy efficient as district heating. new technologies ventilation controls	services and other infrastructur e	energy efficiency measures new technologies solar energy tariffs thermal energy	building application improving buildings lower standards in buildings minimum standards no national accreditation system saving energy measures sustainable housing developments	central heating district heating	new technologies Sustainable areas

<b>Transport</b>	Cycling Plan TOD train stations Transport Plan	mobility		insufficient public transport license for bus routes most profitable routes public transport are difficult to be taken by local governments transportation is provided by private companies		Bicycling Transport
<b>Urban form and urban development</b>	development and densities increasing density in areas already served by district heating Land Use small orientation	compactness houses in non-urban areas New housing areas	compact city loosing population new developments orientation of buildings regional singular buildings	more houses	land use shopping centre	Brownfields new area New housing areas regional
<b>Urban design and heritage</b>			heritage site historical city materials, colours and general preservation of old buildings			urban design
<b>Culture</b>	cultural attitude develop minds no negative voices against densification		cultural attitude We like compact cities individual freedom to build			

## 6.6 Workshop Turku: Urban energy planning in the case cities

The workshop took place during the PLEEC meeting in Turku, 26-28 March 2014. Prior to the workshop a draft of D4.1 “Framework for case study reports” was sent to all WP4 participants. Also, the city partners were asked in advance to prepare and bring material (maps, reports...) related to the four themes of WP4.

**Table 6: Workshop participants**

Partner organisation	Participant
Eskilstuna	Vanessa Scheffler
Jyväskylä	Laura Ahonen
Santiago de Compostela	José Ángel Oreiro Romar, Eva Ezcurra de la Iglesia
Stoke-on-Trent	Edward Sidley
Turku	Risto Veivo, Osku Uurasmaa
Regional Council SW-Finland	Aleksis Klapp
TUAS	Jari Hietaranta
TU Delft	Stephen Read
UCPH	Christian Fertner, Niels Boje Groth, Juliane Grosse
EEM	Mikael Kullman
Natural Oy	Celia Peterson (facilitator)

There was no participant from Tartu in our workshop, however, some issues were discussed with Kasper Alev and Jaanus Tamm during a joint dinner in Turku.



**Figure 7: Photos from the workshop**

Below some notes from the discussions, summarized by Christian Fertner (UCPH), not necessarily reflecting the opinion of the city partners.

### **General issues which could be elaborated further on:**

- Historical plans – did they get realised (Ed)
- Plans not only for the municipality but for the Functional-Urban-Region (Jari)
- Effects of municipal reforms – in the past and future (Laura)
- Relation to neighbouring municipalities: Cooperation (infrastructure) vs. Competition (housing, taxes): “We protect our side of the lake, but they designate new housing areas on their side.” (Jose)
- National policies set the frame (Niels)
- “Consider also the other side” – economic drives for development, who decides actually, who has capital (Stephen)
- How to design the urban energy system so that peak-usage is avoided – e.g. with a mix of different providers and users (Oscu)
- Have to find new ways for (local) energy companies to make money
- Connect the systems! (CHP, Biogas, transport modes...)
- Consider also energy companies / energy production (Stephen) & how is energy reduction seen by municipalities, consumers and producers
- Also work on future plans/visions (Lauri)
- How to change embedded habits of today to embedded habits of tomorrow? (Stephen)

### **Notes per city**

#### **Santiago:**

- Regional laws, but no regional plan
- Empty historical buildings in the centre

#### **Jyväskylä:**

- Fragmented municipal area (Muurame municipality surrounded by Jyväskylä municipality)
- Historically dispersed urban structure – traditionally no space restrictions
- Today, also a compact urban area is valued, but it is new in a Finnish context.
- “Finland has urbanised, finally.”

#### **Eskilstuna:**

- New, direct train connection to Stockholm in 1998 (1:00 h) – second track planned, to be opened 2017 (0:50 h) → commuting from/to Stockholm possible
- Also growth in jobs?
- Migration from Stockholm but also from small towns around Eskilstuna
- Densification strategy for the inner city, using brown field and unused parking areas
- Can make special contracts with developers if municipal land gets developed – not when it's private land

#### **Turku (much more available from the interview tapes):**

- Different alternatives for the regional form of the city and its infrastructure (polycentric, star shaped, sprawl...) where considered for Turku

- Politicians focus on: landowners, voters, attracting new inhabitants

Stoke:

- A key objective of national policy is to proactively drive and support sustainable economic development. Housing development is seen as a key part in achieving this aim.
- If a proposal can provide jobs or housing, then criteria for sustainable development, in some cases, are not prioritised.
- 90% of all flats are privately owned.

Material prepared for the workshop by the city partners is available on the internal PLEEC homepage in the WP4-folder. The notes do not necessarily reflect the opinion of our city partners.